ortofon

MAGNETO-DYNAMIC STEREO CARTRIDGE

All ORTOFON magnetic cartridges – M 20 FL Super, M 20 E Super, VMS 20 E Mk II, F 15 E Mk II, F 15 Mk II, FF 15 E Mk II, and FF 15 Mk II – use the patented VMS principle where a variable magnetic shunt is the moving element, working in the centre of a toroidal magnet.

These cartridges are precision components designed for use with a wide variety of equipment, ranging from high quality home music installations to the latest state-of-the-art high fidelity equipment. All the models have a very low mass (5 grams) and should therefore be used in tone arms capable of operating at tracking forces below 30 mN (3 grams) with lightweight cartridges.

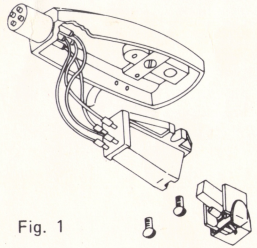

Fig. 1

MOUNTING

Before mounting, we suggest that the stylus unit be removed from the cartridge body to prevent damaging the delicate cantilever and diamond. Take the stylus unit between thumb and forefinger and gently withdraw by pulling it forward out of the cartridge. Put the stylus unit in a safe place for later re-mounting. Before mounting, note any specific instructions from the tone arm manufacturer regarding the use of spacers and the location of the diamond tip relative to the arm. Use the mounting hardware provided with the tone arm or with the cartridge. All ORTOFON cartridges have standard 1/2'' (12.7 mm) mounting centres.

When the cartridge body is fastened to the head shell, the four coloured leads in the shell should be connected to the corresponding colour-coded pins on the rear of the cartridge (see fig. 2). The standard colour-coding is:

White:	Left channel, signal (L)
Blue:	Left channel, ground (LG)
Red:	Right channel, signal (R)
Green:	Right channel, ground and internal grounding (RG)

The leads should be connected to the pins by means of clips and not by soldering directly onto the pins.

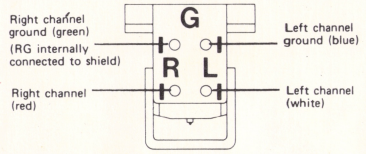

Fig 2

The ORTOFON cartridges are shielded against stray hum fields. However, hum can still be introduced in the system by improper grounding of tone arm and turntable. The tone arm body and turntable should be individually connected to the amplifier ground terminal or chassis. This ground point should preferably be close to the phono input ground. Note that there is an internal connection from the cartridge shield and metal parts to the RG terminal pin. There is no need to make any further ground connection to the cartridge body.

At this stage the stylus unit can be re-mounted. The guiding slot of the cartridge body gives correct alignment. Press in the unit until it firmly touches the front part of the cartridge body.

ADJUSTMENTS

Balance the tone arm and the mounted cartridge in accordance with the turntable instructions.

To achieve optimal tracking ability, apply the following recommended tracking forces:

M 20 FL Super	15 mN (1.5 grams)
M 20 E Super	10 mN (1.0 gram)
VMS 20 E Mk II	10 mN (1.0 gram)
F 15's Mk II	15 mN (1.5 grams)
FF 15's Mk II	20 mN (2.0 grams)

These recommended tracking force values should not be exceeded by more than 5 to 10 mN (0.5 – 1 gram) to keep the cantilever from receding into the grooved portion of the stylus unit housing.

To ensure a correct vertical tracking angle of 20° when the cartridge is in the playing position, the mounting block should be parallel to the surface of the record. You may have to adjust your tone arm for height to achieve this condition. When used in a record changer, the cartridge must tilt slightly downwards towards the record with only one record on the turntable disc. This prevents the rear of the cartridge from touching the surface of the topmost record while playing. This is especially important if the records are warped.

To maintain maximal channel separation, the stylus must stand vertically in the groove as seen from the front of the cartridge. To check this critical position, place a small pocket mirror of the same thickness as a record on the turntable disc. With the stylus standing on the mirror, see that the front edges of the stylus unit housing are parallel with their images in the mirror.

Even small errors will decrease the channel separation, and adjustments should be made, either by twisting the head shell in the tone arm or by placing thin spacers between the mounting block and the head shell.

All ORTOFON magnetic cartridges require a recommended load resistance of 47 kilo ohms in parallel with 400 pico farads in total per channel. Thus, when the cartridge is used on turntables equipped with low-capacitance cables, the total capacitance of tone arm wiring, cables, and input of the amplifier will be smaller than the recommended value. In such cases it is necessary to increase the capacitance by soldering a small capacitor from the inner lead to the shield in each channel. The extra capacitance may also be added in the form of an extention cable.

When loaded with the recommended resistance and capacitance, the ORTOFON cartridges have optimal frequency response and give the full benefits of superb music reproduction.

STYLUS REPLACEMENT

The stylus unit used in the ORTOFON cartridges is the most critical component. To maintain the original performance of your cartridge, be certain that any replacement stylus you buy is **a genuine ORTOFON unit.** Substitutes might seriously derate the performance of your cartridge.

When the diamond stylus is worn or damaged – or you want to upgrade your F 15 Mk II or FF 15 Mk II by replacing the spherical stylus by an elliptical one – it is a very simple and quick matter to exchange your existing unit.

Remember to inspect your diamond stylus for wear or damage at frequent intervals – or let your ORTOFON dealer do it. Also remember to clean the diamond tip by removing dust with a suitable brush, working from the back to the front of the stylus unit parallel with the cantilever. If you regularly clean and inspect your stylus unit and ensure that your records are always clean, your cartridge will give the finest quality performance and preserve your valuable record collection from wear.

WARRANTY

Your ORTOFON cartridge is warranted to be free from electrical or mechanical defects for a period of one year after purchase. This warranty, however, does not apply to stylus wear or breakage, nor to the abuse of the stylus cantilever.

If you wish to return the cartridge for test or repair, please do this through your ORTOFON dealer and make certain that the cartridge is packed so that it cannot be damaged in transit (a situation for which ORTOFON cannot accept responsibility). Also include a description of the problem or fault i question.

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